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ORIGINAL ARTICLE

The Global Body Examination (GBE). A useful instrument for evaluation of respiration

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Abstract

Background and aims: Assessment of respiration is important in medicine and physical therapy. As respiration is multifaceted, we need several specific examination methods. The purpose of this study was to develop a method for examination of visible respiratory movements, by extracting from two examinations the items with best ability to discriminate among healthy controls, patients with pain disorders and patients with psychotic disorders. *Methods:* Two physiotherapists independently examined 132 individuals (34 healthy persons, 32 with localized pain, 32 with widespread pain and 34 with psychoses). Items were assigned to subscales by explorative factor analysis. Internal consistency of subscales was examined with Cronbach's alpha. To examine validity, one-way analysis of variance and the area under the curve (AUC) were used. *Results:* We identified four subscales: Tension, Position of Thorax, Basal respiration and Thoracic movements. Cronbach's alpha ranged from 0.75 to 0.86. The subscales' discriminating ability was excellent between healthy controls and patients, and fair between patients with localized pain and the two other patient groups. *Conclusions:* The respiration domain of the new Global Body Examination has 21 items, which comprise four subscales with high internal consistency and good ability to discriminate between healthy persons and patients with pain disorders or psychosis.

Key words: *methodology, musculoskeletal (other), respiratory*

Introduction

Respiration is necessary for a person's life, health and vitality and reacts to physical and mental activity as well as emotions (1,2). Hampered respiration therefore represents a threat to human health. Consequently, assessment of respiration plays an important role in health evaluation in medicine and physical therapy.

During recent years, the International Classification of Functioning, Disability and Health (ICF) (3) has been a reference for such evaluation. The ICF has codes for respiration functions (like rate and rhythm), respiratory muscle functions (like functions of the thoracic respiratory muscles and functions of the diaphragm) and structure of the respiratory system (like trachea, lungs and muscles of respiration). ICF has been used in a number of studies to evaluate consequences of illness and disease. However, few of them have focused on respiration. We performed a

literature search in Ovid Medline® from March 1946 through week 2 of 2012, combining the terms "International Classification of Diseases" or "ICF" and "respiration disorders" or "respiration". The search gave just nine references. None of them had respiration as the main focus, but two papers included evaluation of human respiration using ICF: Gradinger and coworkers (4) developed ICF core sets for persons with sleep disorders, and Wolff and coworkers (5) identified concepts contained in outcome measures of clinical trials on four internal disorders (chronic ischemic heart disease, diabetes mellitus, obesity and obstructive pulmonary disease). The ICF categories are merely descriptive, and more specific measures are needed to give a comprehensive evaluation of different aspects of respiration. Usually respiratory disability is assessed by means of maximal oxygen uptake, as described by Cotes and coworkers (6).

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An alternative approach is based on inspection of visible respiratory movements. Haugstad and coworkers (7) developed a standardized Mensendieck test (SMT) where respiration was evaluated by three 8-point scales: global impression, and respiration response to arm lift and to pelvic lift.

The inspection of visible respiratory movements is also the focus of interest in psychomotor physiotherapy (PMPT), which gives a more comprehensive evaluation of the interplay between respiratory muscles in thorax and abdomen. In this tradition, respiratory patterns are seen as integrated with posture, movements and muscular tension (1,8). Several studies have shown that patients with musculoskeletal disorders, emotional problems or mental disorders have respiratory aberrations (9–13). Therefore, a main objective of PMPT is to develop unhampered respiratory movements, where the bellow can move freely according to emotional and physical needs. Assessment of respiration is essential in evaluation for treatment, and several body examinations have been developed to guide physiotherapeutic interventions. Three of these have been refined by quantitative research: the Comprehensive Body Examination (CBE) (14), the Global Physiotherapy Examination-52 (GPE-52) (15) and the Resource Oriented Body Examination II (ROBE II) (13). A recent study found many similarities between CBE and GPE-52 (16). Both methods have demonstrated adequacy as examination tools in patients with long-lasting musculoskeletal pain, as well as in patients with various psychosomatic and psychiatric disorders. However, CBE and GPE-52 seem to measure partly different dimensions.

The present study is part of the development of a new comprehensive instrument, the Global Body Examination (GBE). The aim of this part was to develop an improved evaluation tool for respiration by extracting from CBE and GPE-52 the respiration items with best ability to discriminate among healthy controls, patients with pain disorders and patients with psychotic disorders.

We wanted to test the following questions:

(1) What are the respiratory dimensions in a factor analysis of the pooled items of the CBE and GPE-52?
(2) What are the psychometric properties (internal consistency, subscale intercorrelations and ability to discriminate between groups) of the subscales measuring these dimensions compared with the original methods?

Methods

A cross-sectional comparative study was performed by two experienced physiotherapists who independently examined persons by means of CBE and GPE-52.

Inclusion

To recruit patients with pain disorders or patients with psychoses, we sent information about the project to physiotherapists and doctors working in different pain and spine clinics, in physiotherapy clinics and in psychiatric hospitals. The patients should either have long-lasting (>6 weeks) musculoskeletal pain or a severe psychiatric disorder, and they were all recruited by their therapists. The healthy persons were volunteering administrative personnel or health workers in psychiatric wards. They should not have had any pain the last 14 days prior to the examination or been sick-listed the last year due to musculoskeletal complaints. The recruitment lasted until a minimum of 30 persons were included in each group.

Subjects

Altogether 132 individuals were included. Of these 34 were healthy. As patients with long-lasting musculoskeletal pain may have several diagnoses and pain in more than one area (17), a simple and formerly validated pain drawing was used to categorize these patients into either having localized pain or widespread pain (18). Patients with localized pain marked an average ($\pm$ standard deviation, SD) of 12.0 ± 9.9 squares on the pain drawing, compared with 35.5 ± 19.7 for those with widespread pain. For patients with psychoses, the diagnosis was made by psychiatrists at the hospital, and confirmed by the authors. The examining physiotherapists did not have access to the medical diagnoses. However, it was impossible to conceal that patients had psychoses.

The patients were categorized into three subgroups: 32 had long-lasting localized pain, 32 had long-lasting widespread pain and 34 were hospitalized due to psychoses. A majority (67%) of the individuals were women, ranging from 50% in the psychosis group to 84% among patients with widespread pain. The mean age was 38.7 ± 12.5 years, ranging from 32.2 years in the group of psychotic patients to 44.4 among those with localized pain. The mean body mass index was 24.9 ± 4.0 kg/m^2 ranging from 23.4 kg/m^2 in the healthy controls to 26.8 kg/m^2 among those with widespread pain.

Scoring procedure

The Respiration domain of the CBE has 22 items in five subscales: Changeability (four items),

Tension (six items), Movement Supine (five items), Movement Upright (three items) and Position of Thorax (four items). GPE-52 has eight items in two subscales called Respiration standing (four items) and Respiration supine (four items). Details are given in the manuals of CBE and GPE-52 (19,20).

The participants were examined in shorts, females kept their bras. Few individuals can breathe as usual when they are aware that a therapist is evaluating the respiration. The physiotherapists therefore observed respiration while examining posture, and very few seemed to realize that respiration also was inspected. All individuals were examined in random order between the two testers on the same day or on two following days. Each physiotherapist used one method, and they were familiar only with the instrument they were using.

The scoring procedures of the two methods are described in detail in previous publications (9,11). The scorings are either unipolar or bipolar, and performed in a defined and standardized way. Previous research has indicated no significant differences in the scores between the left and the right side of the body in any of the methods, and only the left side of the body was used in this study.

A score of 0 indicates ideal findings, and any deviation away from 0 indicates respiratory aberration, either positive or negative. In this paper we have reversed the original CBE scores, so that Position of thorax is rated on a scale ranging from -6 (extreme expiration) to $+6$ (extreme inspiration). Respiratory movements are rated from -6 (extremely increased movements) to $+6$ (extremely restricted movements). Tension is scored on 7-point scales ranging from 0 (ideal) to 6 (extreme tension). Changeability is scored from 0 (ideal) to 6 (extreme lack of changeability) except for one item: the item of thoracic resistance to manual compression is scored from -6 (extreme lack of resistance) to $+6$ (extreme resistance). GPE-52 rates respiratory movements on a 15-point scale (-7 to $+7$), where negative scores indicate too large inspiration movements and positive scores indicate restricted movement. CBE registers inspiration amplitude in the upper, middle side of the ventral thorax, the lower lateral thorax, the epigastrium and the hypogastrium. In GPE-52, the inspiration amplitude is observed medially in the hypogastrium and high costal area, and on the lateral side in the epigastrium and low costal area.

The scores of the 30 tests from CBE and GPE-52 are given in Table I. Scores are given as raw scores and as deviations from 0 irrespective of direction (deviation scores).

Statistical analysis

Data were analyzed with PASW statistics version 18.0. An explorative, rotated principal axis factor analysis (EFA) was performed to reduce number of items and to examine construct validity, and the pattern matrix was used. A scree test of eigenvalues was used to decide number of factors. Following the EFA, we calculated subscale scores by adding the scores of items that loaded >0.50 on one factor, and with no loading on any other factor <0.10 lower than on the factor in question. We used Cronbach's alpha coefficient to estimate internal consistency of the subscales. Ideally, this coefficient should be between 0.70 and 0.90 (21). Differences between groups were evaluated by one-way analysis of variance with Scheffé's *post hoc* test. The receiver operating characteristics curve (ROC) was used to evaluate the subscales' ability to discriminate between healthy individuals and patient groups. The area under the curve (AUC) expresses the discriminative ability. An ROC measure of AUC between 0.7 and 0.8 is considered acceptable, between 0.8 and 0.9 is excellent, and ≥ 0.9 is considered outstanding (22, p. 162).

Ethics

The study was approved by the Regional Committee for Medical and Health Research Ethics, Western Norway, and was performed according to the Helsinki Declaration. Each participant was given oral and written information about the study and signed an informed consent form.

Results

Descriptive statistics for the respiration items are shown in Table I. The items are grouped according to the subscales of the CBE and GPE-52. Bimodal distributions of raw scores were basically seen in three subscales: Movements upright, Movements supine and Position of thorax.

An analysis of thoracic movement in the CBE revealed two different patterns. A common pattern was restricted movements both in upper and lower thorax. However, a considerable minority of those with restricted movements in lower thorax had increased movements in upper thorax, particularly among patients with psychosis. For these persons, positive low thoracic scores and negative high thoracic scores would have given a sum score close to 0, if a single scale was used. Thereby it could falsely give the impression of ideal scores. In contrast, deviation scores would adequately have rated thoracic movements as clearly pathological. Due to these findings, we chose to base our factor analysis on deviation

Table I. Respiration items grouped according to dimensions.

Description of clinical dimensions and items	Raw scores			Deviation scores		
	Mean	SD	Range	Mean	SD	Range
CBE						
Changeability						
S: adaptability to jaw movements	3.42	1.69	0 to 6	3.42	1.69	0 to 6
S: adaptability to gaping	3.57	1.67	0 to 6	3.57	1.67	0 to 6
U: spontaneity	1.76	1.84	0 to 6	1.76	1.84	0 to 6
S: thoracic resistance to manual compression	− 2.05	2.22	− 6 to 4	2.48	1.73	0 to 6
Tension						
S: expiratory muscles constrictions, shortenings	0.89	1.30	0 to 6	.89	1.30	0 to 6
S: expiratory muscles contractions	1.12	1.41	0 to 6	1.12	1.41	0 to 6
U: expiratory muscles constrictions, shortenings	2.71	1.60	0 to 6	2.71	1.60	0 to 6
U: active expiratory movements	2.52	1.45	0 to 6	2.52	1.45	0 to 6
S: rhythm	1.42	1.49	0 to 5	1.42	1.49	0 to 5
U: rhythm	1.74	1.49	0 to 6	1.74	1.49	0 to 6
Movements supine						
S: upper thorax	0.67	1.88	− 4 to 6	1.28	1.53	0 to 6
S: middle thorax	1.51	2.37	− 4 to 6	2.11	1.84	0 to 6
S: lower thorax	4.17	2.20	− 3 to 6	4.26	2.02	0 to 6
S: epigastrium	0.79	1.62	− 3 to 6	1.12	1.40	0 to 6
S: hypogastrium	1.00	1.78	− 2 to 6	1.26	1.60	0 to 6
Movements upright						
U: upper thorax	0.32	2.24	− 5 to 6	1.70	1.48	0 to 6
U: middle thorax	1.88	2.48	− 5 to 6	2.59	1.72	0 to 6
U: lower thorax	3.95	2.62	− 2 to 6	4.05	1.96	0 to 6
Position of thorax						
U: position of the upper ventral thorax	− 0.67	2.00	− 5 to 5	1.42	1.57	0 to 5
U: position of the lower ventral thorax	− 0.31	2.02	− 6 to 5	1.22	1.64	0 to 6
U: position of the upper dorsal thorax	− 0.08	2.00	− 5 to 4	1.34	1.49	0 to 5
U: position of the lower dorsal thorax	− 0.21	1.51	− 5 to 4	0.79	1.30	0 to 5
GPE-52						
Respiration standing						
Hypogastrium medial	5.27	0.78	3 to 7	5.27	0.78	3 to 7
Epigatrium lateral	3.44	1.07	1 to 7	3.44	1.07	1 to 7
Low costal lateral	3.62	1.08	− 1 to 7	3.62	1.08	1 to 7
High costal medial	− 0.02	1.34	− 4 to 1	1.03	0.85	0 to 4
Respiration supine						
Hypogastrium medial	3.20	1.12	1 to 6	3.20	1.12	1 to 6
Epigastrium lateral	2.17	1.02	1 to 5	2.17	1.02	1 to 5
Low costal lateral	3.18	1.22	− 1 to 7	3.18	1.22	1 to 7
High costal medial	0.19	0.62	− 2 to 1	0.34	0.55	0 to 2

$n = 132$. U, upright; S, supine.

scores. A scree test indicated three or four factors. We chose the four-factor solution, as that proved most clinically meaningful.

The factor loadings are shown in Table II.

The four subscales were:

(1) Tension
(2) Position of thorax
(3) Basal respiration movements
(4) Thoracic movements

The subscales and their items are shown in Table III. As seen from the table, all subscales had satisfactory internal consistency, ranging from 0.75 to 0.86, with a median of 0.83. The correlation between subscale scores and corresponding factor scores ranged from 0.94 to 0.96, indicating that the subscale scores could replace the factor scores without substantial loss of information. The intercorrelations between sub-scale scores ranged from 0.14 (between Position of thorax and Thoracic movements) to 0.41 (between Tension and Basal respiration movements), with a median of 0.33.

Table IV shows the mean scores and their standard deviations for the four subscales and the sum score in the different groups. A one-way analysis of variance showed that all subscales and the sum scores discriminated significantly among the four groups (df = 3/128, $p < 0.0005$ for all scales). The F-values ranged from 9.0 (Position of thorax) to 22.5 (Basal respiration movements). Scheffé's *post hoc* test showed that the scores for the healthy controls were significantly different from the scores of all three

Table II. Factor loadings of 30 respiration items from CBE and GPE-52 (Pattern matrix).

	F1	F2	F3	F4
S: Adaptability to jaw movements				38
S: Adaptability to gaping				33
U: Spontaneity	47			
S: Thoracic resistance to manual compression				45
S: Expiratory muscles constrictions, shortenings	**76**			
S: Expiratory muscles contractions	**72**			
U: Expiratory muscles constrictions, shortenings	**75**			
U: Active expiratory movements	**74**			
S: Rhythm	**57**			
U: Rhythm	**53**			
S: Movements upper thorax				**62**
S: Movements middle thorax				**75**
S: Movements lower thorax				**74**
S: Movements epigastrium	38			36
S: Movements hypogastrium	40			33
U: Movements upper thorax				40
U: Movements middle thorax	37			**58**
U: Movements lower thorax				**65**
U: Position of the upper ventral thorax		**−85**		
U: Position of the lower ventral thorax		**−86**		
U: Position of the upper dorsal thorax		**−69**		
U: Position of the lower dorsal thorax		**−84**		
U: Respiration hypogastrium medial			**62**	
U: Respiration epigastrium lateral			**81**	
U: Respiration low costal lateral			**55**	
U: Respiration high costal medial	32			
S: Respiration hypogastrium medial			**64**	
S: Respiration epigastrium lateral			**76**	
S: Respiration low cost lateral			**65**	
S: Respiration high costal medial	44			

U, upright; S, supine. In bold: Items with loading > 0.50. Loadings < 0.30 are deleted.

patient groups on all subscales with one single exception: for Position of thorax, the score was not significantly different between healthy controls and patients with localized pain. There were only minor differences among the patient groups. Patients with localized pain were significantly different from the two other patient groups on Basal respiration movements, and from patients with psychosis also on Position of thorax. Patients with widespread pain and patients with psychosis were not significantly different from each other on any subscale.

The results are illustrated in Figure 1, which clearly shows that the subscales differ in mean score across groups, but also in their variability within groups. The within group variability is particularly high in the Position of thorax subscale for patients with widespread pain and with psychosis.

We also calculated the sum of all subscale scores. This Respiration sum score discriminated significantly between healthy controls and all patient groups and between patients with localized pain and patients with psychosis. Finally, we calculated

ROC curves to evaluate the ability to discriminate between healthy controls and patients. The AUC was outstanding for the sum score (0.92), and excellent for Basal respiratory movements (0.86), Tension (0.82) and Thoracic movements (0.82). For Position of thorax the AUC was clearly lower (0.69), reflecting the considerable within group variability mentioned above.

Discussion

This study has shown that the initial seven Respiration subscales with altogether 30 items could be reduced to 21 items making four scales that discriminated well between healthy controls and three patient groups.

The first subscale, Tension, was nearly identical to the CBE subscale Tension (9). The subscale comprises items measuring active expiration, as well as constrictions in the abdominal and lower intercostal soft tissue and dysrhythmic respiration. When respiration muscles work both during inspiration and expiration, the resting phase is reduced. Unnecessary energy is used and the individual often gets tired. Constant contractions of the expiration muscles often lead to short, hard muscles.

The second subscale, Position of thorax, is identical with the CBE subscale with the same name. This scale measures to what extent the examined person has an inspiration or expiration formed thorax (9). This subscale revealed considerable variation among the most severely ill patients, those with widespread pain and with psychoses. This is basically a replication of the findings in other subjects by Bunkan et al. (9), and seems to indicate that the score of this variable is related to factors that at least partly are independent of pain and severe psychopathology.

The third subscale, Basal respiration movements, measures degree of abdominal and low costal movements, which are important for the function of the bottom of the pelvic and the function of the internal organs (23). This subscale also measures the basolateral movements of the thorax, which is important in unhampered thoracic movements. This subscale is important, as clinical experience indicates that the basal respiration movements influence general tension and circulation in the back, hips, internal organs, and also pain in the same areas (11), and are important in controlling emotions (10,13). We found some healthy controls with hampered basal respiration movements. These persons had a flat abdomen, and flat abdomens are often drawn in, which may prevent basal respiration.

The last subscale measures thoracic movements. These movements are important for circulation in the upper back and shoulders and in the organs in the thorax. Bunkan et al. (9) found that respiration

Table III. Item characteristics of the four subscales.

	Mean	SD	CITC	Alpha if item deleted
Tension (alpha = 0.83)				
Upright rhythm (V32)	1.74	1.49	0.58	0.81
Upright expiration muscles shortening (V34)	2.71	1.60	0.64	0.80
Upright expiration muscles contraction (V35)	2.52	1.45	0.60	0.81
Supine expiration muscles shortening (V78)	0.89	1.30	0.58	0.81
Supine expiration muscles contraction (V79)	1.12	1.41	0.61	0.81
Supine rhythm (V80)	1.42	1.49	0.65	0.80
Position of thorax (alpha = 0.86)				
Ventral upper part (V23)	1.42	1.57	0.75	0.80
Ventral lower part (V24)	1.22	1.64	0.78	0.79
Dorsal upper part (V25)	1.34	1.49	0.57	0.88
Dorsal lower part (V26)	0.79	1.30	0.75	0.81
Basal respiration movements (alpha = 0.83)				
Standing medial hypogastrium (v36a)	5.27	0.78	0.60	0.81
Standing lateral epigastrium (v38a)	3.44	1.07	0.67	0.79
Standing lateral low costal (v39a)	3.62	1.08	0.52	0.82
Supine medial hypogastrium (v36b)	3.20	1.12	0.64	0.80
Supine lateral epigastrium (v38b)	2.17	1.02	0.71	0.78
Supine lateral low costal (v39b)	3.18	1.22	0.54	0.82
Thoracic movements (alpha = 0.75)				
Upright: mid thoracic (V28)	2.59	1.73	0.52	0.71
Upright low thoracic (V29)	4.05	1.96	0.44	0.74
Supine: high thoracic (V73)	1.28	1.53	0.48	0.73
Supine: mid thoracic (V74)	2.11	1.84	0.63	0.67
Supine: low thoracic (V75)	4.26	2.02	0.55	0.70

CITC, corrected total item correlation. Variable numbers from the manuals are shown in parenthesis for each item: capital V for items from CBE (19) and v for items from GPE (20).

movements in supine and upright position were weakly intercorrelated and formed two different subscales. However, in this study, movements in supine and upright position were so strongly inter-correlated that the new subscale merged items from both positions. Our results with the new subscale support clinical observations by Braatoy (1, pp. 175–76), Reich (2, p. 375), and Lowen (24, pp. 146–54), that emotional disturbances are related to hampered thoracic respiration. It is worth underlining that patients with widespread pain had close to the same level of aberrations as patients with psychosis.

Strengths and limitations

Strength of the present investigation is that all patients were examined by two physiotherapists who were experts in the examinations they used. Furthermore, the sampling of healthy controls and patients with different degrees and types of

Table IV. Subscale score for groups of patients.

	Healthy		Local pain		Widespread pain		Psychosis		Total	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Tension	0.90	0.65	1.85	0.90	1.85	1.13	2.36	1.05	1.73	1.08
Pos Thor	0.54	0.68	0.91	1.02	1.40	1.33	1.92	1.46	1.19	1.26
Basal Resp M	2.80	0.47	3.36	0.64	3.93	0.69	3.86	0.73	3.48	0.78
Thor M	1.85	1.12	3.01	1.24	3.31	1.21	3.31	1.06	2.86	1.29
Resp sum	6.08	1.95	9.12	2.19	10.48	2.34	11.45	2.56	9.27	3.05

Tension: Healthy significantly different from all other groups.
Pos Thor, Position of thorax: Healthy significantly different from widespread pain and psychosis. Local pain significantly different from psychosis.
Basal Resp M, Basal respiration movements: Healthy significantly different from all other groups. Local pain significantly different from all other groups.
Thor M, Thoracic movement: Healthy significantly different from all other groups.
Resp sum, Respiration sum score: Healthy significantly different from all other groups. Local pain significantly different from psychosis.
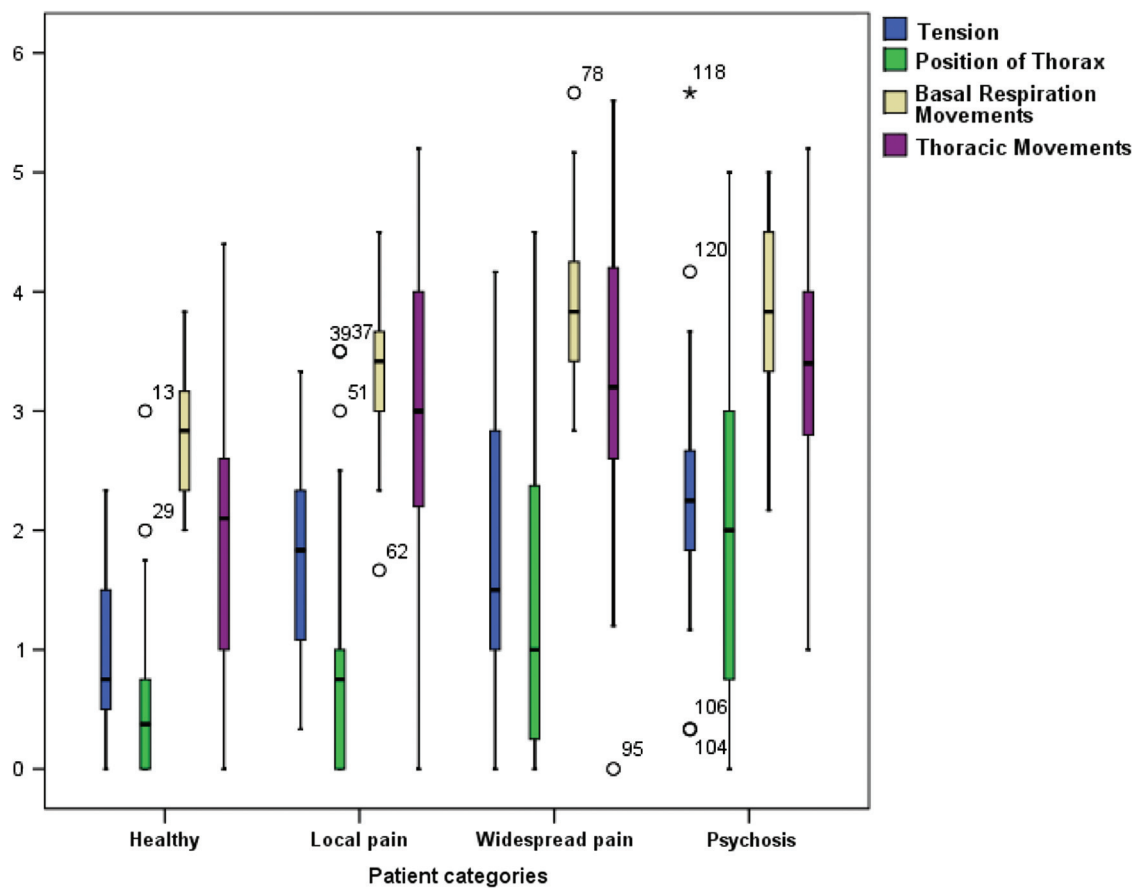
Figure 1. Box plot for average scores in the four respiration subscales in the Global Body Examination.

pathology increases the external validity of the results.

A limitation is that our sample size is marginal to give a stable factor solution. Streiner (25) recommends having at least five to seven individuals per item. However, the subscales showed very good to excellent abilities to discriminate between healthy controls and patients, indicating a criterion validity corresponding to the original examination methods (CBE and GPE-52). It is clearly a limitation that the scales do not discriminate very well among patient groups. This lack of discrimination may partly be due to a considerable variation within the groups, indicating that respiratory function is related to other factors than group membership. For instance, the weak discrimination between patients with localized and widespread pain in the Tension subscale, may indicate that other factors than distribution of pain are of central importance for respiratory function. It is interesting that patients with localized pain had significantly lower scores than the two other patient groups on Basal respiration movements, and lower scores than patients with psychosis also on Position of thorax and on the sum score. This in is line with many studies which have found that patients with localized pain have less pronounced

health consequences, less disability and better outcome compared with patients with widespread pain (17,26–29). The poor ability to discriminate between patients with pain disorders and psychosis is more difficult to explain.

One explanation of lack of discrimination between patient groups may be the fact that respiration is a complex phenomenon, and certain aspects are not covered by our subscales. An important aspect seems to be the combination of restricted low thoracic and increased high thoracic respiration. Such a combination is basically limited to the most severely ill patients, and even among them it was not very common, but it is obviously of clinical importance for those affected. We therefore suggest that our four subscales are accompanied by a description of such a pattern in the evaluation of the more severely ill patients. Respiratory changes from upright to supine position and differences in position of thorax ventrally and dorsally seem to be additional candidates for such descriptions.

A final limitation is that our examination is cross-sectional. A longitudinal investigation might have helped to discriminate between state and trait aspects of respiration. Furthermore, the reliability must be examined in future studies.

Implications

We have developed a new instrument for evaluation of respiration. The subscales and sum-scores have good internal consistency; discriminate excellently between healthy individuals and patients, but only moderately between patients with localized pain and the two other patient groups. None of the subscales discriminated significantly between patients with widespread pain and patients with psychoses.

For an experienced therapist, the examination with this new instrument takes about 5 min. The new scales provide a sound basis for physiotherapeutic examination of patients with long-lasting problems, physically as well as psychologically. The subscales can also be useful in examination of patients with lung diseases (chronic obstructive pulmonary disease, asthma, etc), as these patients have varying degrees of affected respiratory movements, constrictions and contractions in the expiratory muscles. Systematic evaluation may help tailoring more specific interventions, and help documenting change in respiration over time. It will be a challenge for the future to explore the relationship between GBE subscale scores and other measures of respiratory function.

Acknowledgments

Declaration of interest

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